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BIOLOGY

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BOTANICAL SERIES. VOL. II, NO. 2.

PLANTÆ UTOWANÆ.

PLANTS COLLECTED IN BERMUDA, PORTO RICO, ST. THOMAS, CULEBRAS, SANTO DOMINGO, JAMAICA, CUBA, THE CAYMANS, COZUMEL, YUCATAN AND THE ALACRAN SHOALS. DEC. 1898 TO MAR. 1899.

THE ANTILLEAN CRUISE OF THE YACHT UTOWANA.

MR. ALLISON V. ARMOUR, Owner and Master.

BY

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Curator Department of Botany.

PART 1A—Reconsideration of the Cyperaceæ.
Reconsideration of Cakile.

CHICAGO, U. S. A.
August, 1900.

RECONSIDERATION OF THE CYPERACEÆ.*

In working over the Cyperaceæ preparatory to the publication of a Flora of Yucatan—from which region many of the Utowana specimens were derived—and carefully considering each species intended for insertion in that work, a few discrepancies in the classification of the material presented on pages 28–30 became evident, rendering a reconsideration necessary.

As all of the specific descriptions in the proposed Yucatan Flora are planned to be based upon the characters of the fruits, I find it convenient to present this revision in the form intended to be used in that publication.

While I sincerely regret the necessity of differing with Mr. C. B. Clarke, in his excellent monograph of the Antillean Cyperaceæ, in Prof. Urban's Symbole, yet, the impossibility of distinguishing with certainty the seeds of Cyperus, Torulinium and Mariscus by any constant character, confirms the opinion that *Mariscus* and *Torulinium* are but sections of Cyperus, and that the single character: the separation of the fruits from the rachilla, or the rachilla from the rachis, is not sufficient to be classed as generic; especially as this character also intermixes to some extent.

CYPERACEÆ.

Grass-like or rush-like herbs. Inflorescence in solitary or clustered 1-many flowered spikelets; flowers perfect or imperfect, 1 or rarely 2 in the axil of each scale; scales 2-ranked or spirally imbricated. Perianth hypogynous, composed of interior scales or bristles. Stamens 1-3, rarely more. Ovary 1-celled, sessile or stipitate, ovule 1, anatropous, erect, style 2-3-cleft or minutely 2-toothed, rarely simple. Fruit a plano-convex, lenticular, tri-lateral or sub-globose achene:

*In this work I have been ably assisted by Mrs. Agnes Chase, an enthusiastic and careful phytologist, to whom I am indebted for the drawings and much of the descriptive matter here presented.

Achenes bilateral, styles 2-cleft:
- Plano-convex ..... JUNCELLUS
- Bi-convex—
  - Non-tuberculate ..... FIMBRISTYLIS
  - Tuberculate, perianth, none ..... DICHROMENA
  - perianth bristles ..... HELEOCHARIS

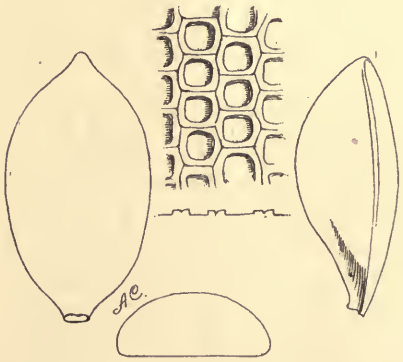
Achenes trilateral, styles 3-cleft ..... CYPERUS
Achenes subglobose, styles 3-cleft ..... SCLERIA

JUNCELLUS (§ Griseb.) C. B. Clarke.

Inflorescence capitate. Fertile flowers bi-sexual; scales distichous, lower 2 empty, persistent; spikelets many-flowered; rachilla persistent, bristles none. Stamens 2. Style 2-cleft. Achenes plano-convex, dorsally compressed.

JUNCELLUS LÆVIGATUS (L.) C. B. Clarke in Urb. Symb. Antill. 2:21.

Cyperus lævigatus Linn. Bracts 2, the lower erect, 5-10 cm. long; upper usually horizontal, 1-4 cm. long. Heads pale-green turning to chestnut, about 8 x 10 mm.; congested spikelets 1-20, oblong, compressed, 2 x 5-10 mm., 40-fruited; scales white, more or less marked with chestnut, the midrib faint, green; broadly ovate, obtuse, dorsally convex, slightly longer than the achene. Achenes brown, ellipsoidal, 1.3 x .7 mm., in section convex on the dorsum and plane on the ventrum; the whole surface marked by more or less hexagonal ridges, including nearly quadrilateral shallow pits.



Moist banks and ditches at Guanica, Porto Rico (731).

FIMBRISTYLIS Vahl.

Inflorescence more or less compound-umbellate. Fertile flowers bi-sexual. Scales numerous, spirally imbricated, lower short, empty. Bristles none. Stamens 3. Style 2-cleft, achenes lenticular.

Achenes lenticular non-tuberculate:
- Markings longitudinal, faint ..... F. ferruginea
- Markings longitudinal, strong ..... F. spadicea

The cuts present: An enlargement of the achene, dorsal view (also lateral view in some cases), a transverse section at its greatest diameter (the base of the section being the ventral side); a portion of the surface magnified 25 diameters, showing the markings, and usually beneath this a cross-section of the same, illustrating their prominence. The enlargements are relatively the same n all the cuts.

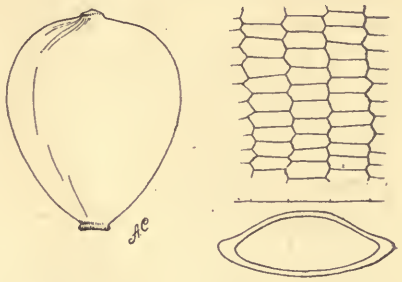
FIMBRISTYLIS FERRUGINEA (L.) Vahl. Enum. 2:291.

Scirpus ferrugineus Linn.

Fimbristylis stans Spr.

Fimbristylis spadicea in part, Britton, on page 29.

Bracts about 3, leaf-like, 1-3 cm. long. Inflorescence umbellate several rayed with one spike sessile; rays 2-3 cm. long; spikes ferrugineous, ovoid, obtuse, 8-10 x 4-5 mm., sometimes continuing to grow and fruit at the apex after the lower scales and achenes have fallen, making entire length of rachis nearly 2 cm.; bractlets short, setaceous, scales ferrugineous with green midrib, ovate, subacute, apiculate, upper part minutely pilose, 3-times the length of the achene. Style twice the length of the achene, broadly flattened and villous below the forking. Achene pale-brown, obovoid, 1.1 x 1.4 mm., in section irregularly lenticular, the dorsum gibbous; surfaces faintly marked by longitudinal rows of laterally elongated hexagonal reticulations.

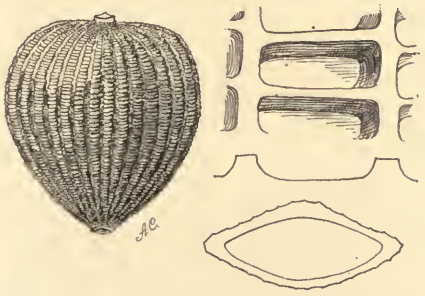


Moist meadow at Cataño, Porto Rico (193); ditches in the environs of Charlotte Amalia, St. Thomas (429); on the borders of a brackish lagoon near the north shore of Cozumel Island (1594).

FIMBRISTYLIS SPADICEA (L.) Vahl. Enum. 2:294.

Scirpus spadiceus Linn.

Bracts 3-4, leaf-like, scabrous on the margin, 13-25 cm. long. Inflorescence a compound umbel, rays 1-6 cm. long; secondary umbels of 3-9 spikes; spikes chestnut, ellipsoidal, subacute, 4 x 10 mm., continuous at the apex as in F. ferruginea; bractlets short, setaceous; scales chestnut with green midvein, chitinous, broadly ovate, obtuse, subapiculate, 3-times the length of the achene. Style twice the length of the achene, villous throughout. Achene dark-fuscous, truncate-obovoid, .95 x 1.1 mm., in section lenticular, the dorsum strongly gibbous; surfaces prominently marked by longitudinal lines composed of rows of broad reticulations enclosing deep oblong pits.



Moist meadow at the Port of Poncé, Porto Rico (664).

HELEOCHARIS R. Br.

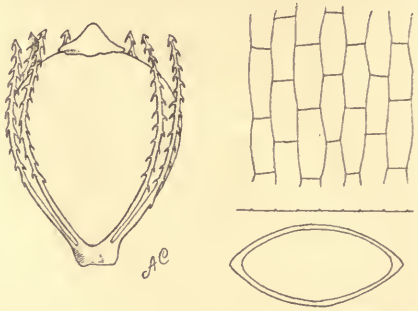
Fertile flowers bi-sexual. Scales many, spirally imbricated, lower empty and bracteate. Bristles 7, subequal to the achene.

Stamens 3. Style 2-cleft; achene lenticular, tuberculate. Inflorescence a terminal spike.

HELEOCHARIS CAPITATA (L.) R. Br. Prod. 225.

Scirpus capitatus Linn.

Spike light-brown, ovoid, obtuse, 3 x 3.5 mm.; scales densely imbricated, the lower somewhat enlarged and bract-like; fruiting scales brown with green midrib, broad, ellipsoidal, obtuse, twice the length of the achene. Stamens twice the length of the achene. Bristles pale-ferrugineous, retrorsely barbed, as long as, or shorter than, the achene. Achene, including the tubercle, pyriform, .7 x 1 mm.; tubercle white, .1 x .2 mm.; achene proper polished-black, in section lenticular, the surfaces longitudinally marked by faint, elongated, hexagonal reticulations, interspaces unoccupied.



Boggy spot in a field at Cataño, Porto Rico (175); wet soil at the Caleta Cozumel (1526); borders of a brackish lagoon south of Progreso, Yucatan (1687).

DICHROMENA Vahl.

Inflorescence in a terminal head subtended by long leaf-like bracts. Fertile flowers bi-sexual; scales numerous, spirally imbricated, the lower and upper empty or infertile; spikelets few-fruited; bristles none. Stamens 2 or 3. Style long, 2-cleft, achene lenticular or appearing elliptical tuberculate:

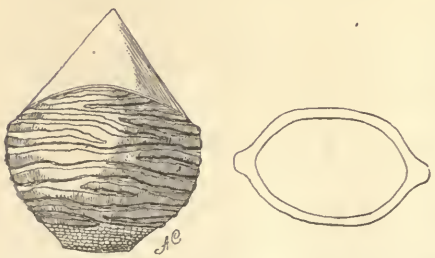
Achenes bi-convex, tuberculate:
- Ridges few, transverse, smooth ..... D. pubera
- cellular, large ..... D. colorata
- small ..... D. radicans

DICHROMENA PUBERA Vahl. Enum. 2:241.

Schœnus pubescens H. B. K.

Dichromena nervosa Britton, on page 30.

Bracts six, 3-9 cm. long, deflexed spreading, softly pubescent, ciliate and white on the upper surface at the base. Heads pale-cinnamon, subglobose, 10-14 mm. wide, composed of 5-8 spikelets; spikelets narrowly ovoid, 8 x 3 mm., 3-fruited; scales ovate, subacute, more than twice the length of the achene. Stamens 2. Achenes bronze-brown, the beak excluded depressed-globose, 1.3 x 1.4 mm.; beak dark-brown, sharply conical, decurrent at the base, .6 mm. high.



Achene in section elliptical, the angles prominent; surfaces marked by irregular, sometimes branching, horizontal smooth and shining ridges.

Moist banks and ditches at Bayamon, Porto Rico (338), and at Port Antonio, Jamaica (927).

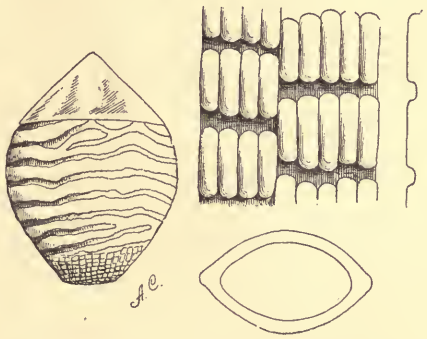
Dichromena colorata (L.) Hitch. Pl. Baham. 141.

Schœnus coloratus Linn.

Dichromena pubera and radicans Britton, on page 30.

Dichromena leucocephala Michx.

Bracts 3-5, deflexed-spreading, 5-10 cm. long, basal portion white. Inflorescence in white globose heads 10-14 mm. wide, composed of 8-16 ovoid spikelets 3 x 5-8 mm., 1-3-fruited; scales white with a hyaline border, conoid, subacute, keeled, nearly three times the length of the achene. Stamens 2. Achenes (excluding the beak) dark cinnamon-brown, obovoid, 1.2 x 1.15 mm. Beak broadly-conical, darker than the achene, .5 mm. high. Achene in section lenticular, the angles strongly marked, the surfaces marked by prominent horizontal intermitting ridges composed of oblong, raised cells, the interspaces shallow and narrow.

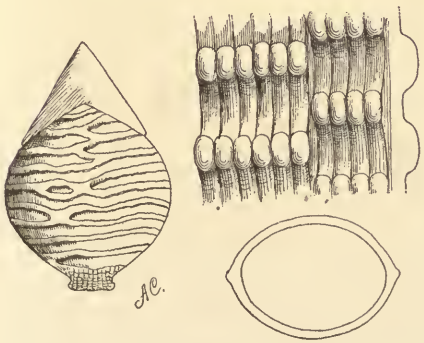


In a bog back of Paget's Landing, Bermuda (54, 60); moist meadow at Cataño, Porto Rico (152); and boggy soil near the center of the island of Grand Cayman (1375).

Dichromena radicans Cham. and Schl. Linnea 6:38.

Dichromena pubera and *nervosa* Vahl. in part.

Bracts 3-5, minutely ciliate and sometimes white at the base. Heads 8 x 10 mm., composed of 1-3 light cinnamon-brown spikelets 9 x 3 mm., lanceolate, 5-fruited; scales with darker cinnamon keel, triangular-ovate, obtuse, 3-times the length of the achene. Stamens 3. Achenes (excluding the beak) dark-brown, orbicular, .9 x 1 mm. Beak black, sharply conical, mitriform, .3 mm. high. Achene in section elliptical, the angles slightly marked; the surfaces marked by about 12 horizontal, intermittent ridges composed of small, oblong, raised cells, with deep broad interspaces.



Wet soil, near the center of the island of Cozumel (1562).

CYPERUS Linn.

Including *Mariscus* and *Torulinium*. Inflorescence in more or less densely disposed subumbellate spikes. Fertile flowers bi-sexual. Rachilla winged or wingless; spikelets few to many fruited; scales distichous, the lower two empty; bristles none. Stamens 1-3. Style 3-cleft; achene trilateral:

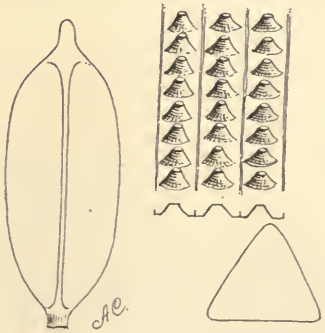
Achenes trilateral, styles 3-cleft:
- Surfaces papillate in longitudinal lines.....C. virens
- Surfaces reticulate—
  - hexagonally.....C. ochraceus
  - lozenge-shaped.....C. elegans
- Surfaces reticulate and papillate—
  - reticulations of faint lines.....C. brizæus
  - reticulations of sharp lines—
    - papillæ small.....C. ferax
    - papillæ large.....C. planifolius
  - reticulations of faint ridges.....C. ligularis
- Surfaces pitted.....C. Caymanensis
- Surfaces reticulate and pitted—
  - reticulations of grooved lines.....C. bruneus
  - reticulations of faint raised lines—
    - pits deep, margin narrowly lipped.....C. Michauxianus
    - pits shallow, margin broadly lipped.....C. filiforme

§ *EUCYPERUS*.—Spikelets compressed; rachilla persistent on the axis, scale deciduous.

CYPERUS VIRENS Michx. Flor. Bor. Am., 1:28.

Cyperus Surinamensis Britton, on page 29.

Bracts leaf-like, 1-2.5 dm. long. Inflorescence a compound umbel; rays about 10, 2-4 cm. long; secondary umbels 2-4-rayed 2 cm. long; bractlets 1-2 cm. long. Spikes pale-green, subglobose, 1-5 cm. wide, composed of 10-20 spikelets fascicled upon the reduced rachis; strongly compressed, narrowly ovate, 3 x 8 mm., 6-20-fruited; rachilla wingless. Scales white with a green midvein, translucent, loosely cellular, oblong-ovate, obtuse, keeled, faintly 3-nerved, twice the length of the achene, closely imbricated. Stamen 1, lateral. Style half the length of the achene, divisions short. Achene dull-black, narrowly ellipsoid, 1.4 x .45-.5 mm., in section triangular, angles obtuse, dorsal facets slightly convex, the ventral plane; all marked by regular longitudinal lines including single rows of truncated conical papillæ.

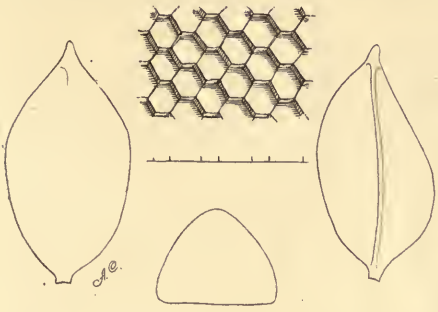


Wet roadside between Santurce and the sea, Porto Rico (299).

CYPERUS OCHRACEUS Vahl. Enum., 2:325.

Bracts leaf-like, 1-4 dm. long. Inflorescence a decompound

umbel, rays 6-10, 2-5 cm. long; secondary umbels 2-4-rayed, rays 2 cm. long; bractlets 5-10 mm. long. Spikes pale-ochre, subglobose, 1 cm. wide, having 10-20 spikelets subdigitate from the reduced rachis. Spikelets strongly compressed, ovate-oblong, 2 x 5-10 mm., 18-20-fruited; rachilla wingless. Scales ochre with a broad, green dorsal stripe, loosely cellular, but less so than in C. virens, ovate, acute, subapiculate, closely imbricated, keeled above but hollow below from the pressure of the adjacent achene; 3-veined, the midvein forking to border the depression; scale a little longer than the achene. Stamen 1, lateral. Style subciliate, shorter than the achene, divisions short. Achene brown, ovoid, .5-.6 x 1.2 mm., in section triangular, the dorsal angle very bluntly rounded, the dorsal facets convex, the ventral plane, all marked by regular, sharp hexagonal reticulations rising perpendicular to the surface of the achene.



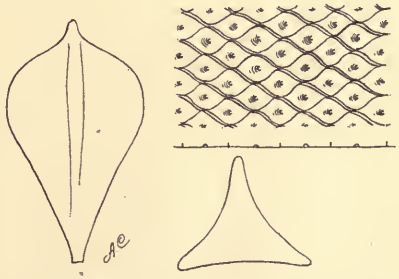
In shallow water covering a field at the Caleta, Cozumel (1519).

Cyperus elegans Linn. Sp. Pl., 2:68.

Cyperus viscosus Sw.

Cyperus viscosus Britton, on page 29.

Bracts 3, leaf-like, 2-3 dm. long. Inflorescence a 6-10-rayed umbel, one spike sessile, rays 1-6 cm. long. Spikes mottled pale-green and brown, subglobose, composed of 8-20 spikelets divergent from the reduced rachis. Spikelets compressed, oblong, 3 x 8-10 mm., 10-fruited; rachilla wingless. Scales fuscous to chestnut with pale-green margins and midvein, sub-orbicular, mucronate, less than twice the length of the achene, obliquely spreading; keel thickened at the apex, expanding into 7 nerves below. Stamens 3. Style shorter than the achene, divided to near the base. Achene black, pyriform, .9 x 1.7 mm., in section triangular, the facets all equally concave and marked by horizontal reticulations resembling a net, the meshes each including a single slight papilla.



Along the borders of a brackish lagoon at The Creek, Cayman Brac (1171); two of these plants are undersized and show a proliferous habit, sprouts replacing achenes in the fruiting spikelets. Brackish bog on the north shore of Cozumel (1596), and in a similar situation at Progreso, Yucatan (1686).

§ *MARISCUS.*—Characters of *Eucyperus* except: rachilla slightly

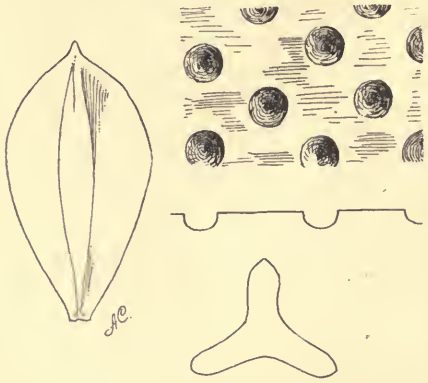
winged, falling away from the axis, two lower empty scales persistent. Stamens 3.

Cyperus Caymanensis sp. nov.

Cyperus sp. Britton, on page 29.

Culms slender, wiry, 3-angled and somewhat grooved, 4-7 dm. long, 1 mm. wide, glabrous. Sheaths brown, scarious, glabrous. Leaves shorter than the culm, 2-4 dm. long, 1.5 mm. wide, folded, setose at the scabrous tip, otherwise smooth.

Bracts 2 or 3, 1-3 cm. long, 1.5 mm. wide. Inflorescence a dense head of 3 or 4 subglobose spikes 6-7 mm. wide, light brown, dense, ovoid, 4 x 5 mm., of 20-30 spikelets crowded on the rachis; spikelets golden brown, ovoid, acute, 1.5 mm. long, rachilla 1-fruited, much reduced. Scales 4 to each spikelet, 2 lower empty, persistent, short, 1-1.1 mm.; fruiting scale golden-brown, broadly ovate, submucronate, keeled, striately 11-nerved, nearly twice the length of and enfolding the achene and the base of the terminal scale which is empty, light-green, scaphoid, acute at the base and 1.7 mm. long. Style divided to near the base, as long as the achene. Achene dark amber-brown, rounded pyriform, .6 x 1.2 mm.; in section strongly triangular the angles keel-like, the facets deeply concave and marked by regularly disposed circular pits.



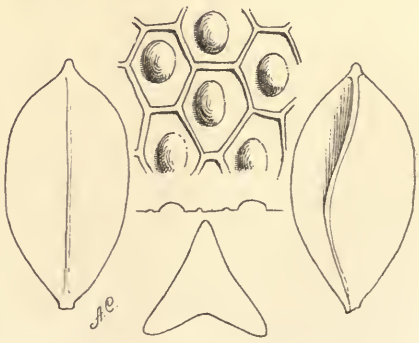
Ditches along the Bodden Bay road beyond Spot Bay, Grand Cayman (1334). Near C. uniflorus pumilus Britton.

CYPERUS LIGULARIS Linn. Amoen. Acad., 5:391.

Mariscus rufus H. B. K.

Mariscus ligularis Urb.

Bracts 4-7, leaf-like, 3-7 dm. long, minutely sharp serrate. Inflorescence a compound umbel, rays 8-12, 1-9 cm. long; secondary umbels congested, subcorymbose; spikes rufous, sessile or subsessile, the terminal one cylindrical, 2-3 cm. long, 1 cm. wide, the lateral deflexed, 1-2 cm. long. Spikelets reddish-brown, ellipsoid, 1.5 x 3-5 mm., densely crowded, divergent, 2-4-fruited; rachilla wings small. Scales reddish-brown with a dull-green midrib, ovate, obtuse, striate, keeled, twice the length of the achene. Style longer than the achene, divided to near



the base. Achene dull-black when ripe, ellipsoid, .65-.7 x 1.4 mm., in section triangular, the dorsal angle sharpest, dorsal facets slightly concave, the ventral deeply so; all marked by faint irregular hexagonal ridges, the interspaces plane and centrally occupied by large and prominent semi-globular papillæ.

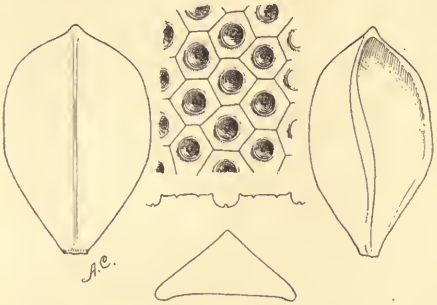
Boggy spot in an open field at Cataño, Porto Rico (156); low sandy soil at Port Antonio, Jamaica (975, 978), and in a like situation at Spot Bay, Grand Cayman (1301).

CYPERUS BRUNEUS Sw. Fl. Ind. Occ., 1:116.

Mariscus bruneus Clarke.

Cyperus Ottonis Britton, on page 29.

Bracts 4, leaf-like, .5-2.5 dm. long. Inflorescence a dense umbel, 1.5-4 cm. wide, formed of 2-6 spikes, rays 1 cm. long. Spikes crimson-lake turning darker with age, subglobose, 14 mm. wide; spikelets about 20, oblong, compressed, divergent, 2 x 6 mm., 5-7-fruited. Scales with bright-green keel, crimson-lake turning to dull rusty-brown faintly spotted with red, broadly ovate, obtuse, apiculate, strongly nerved, nearly twice the length of the achene. Style longer than the achene, divided to near the base. Achene dull-black when ripe, broadly obovoid .7-.9 x 1.4 mm., in section flatly triangular, the facets plane, the ventral having a prominent rounded margin at the angles, and all three marked by nearly regular hexagonal grooves, each interspace occupied by a deep circular pit with a raised lip.



In a dry field near Playa, Porto Rico (683); and in a sandy field near Progreso, Yucatan (1697).

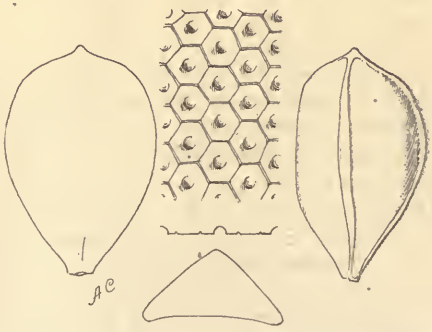
CYPERUS BRIZÆUS Vahl. Enum., 316.

Mariscus brizæus Clarke.

Cyperus Ottonis Boeck.

Cyperus bruneus Britton in part, on page 28.

Bracts 4, leaf-like, .5-3.5 dm. long. Inflorescence a dense, 6-10-spiked umbel, 7 cm. wide; rays .5-2 cm. long. Spikes light reddish-brown at maturity, subglobose, 2 cm. wide; spikelets oblong, compressed, divergently ascending, 2.5 x 10 mm. long, 6-9-fruited. Scales bright reddish-brown or pale roseate, green keeled, ovate, apiculate, striate, twice the length of the



achene. Style longer than the achene, divided to near the base. Achene shining-black, obovoid, .7-.9 x 1.4 mm., in section like C. bruneus, the facets marked by low, sharp, hexagonal ridges, the interspaces occupied by small semi-globular papillæ.

In dry sandy soil, south of Charlotte Amalia, St. Thomas (428); in the sandy, cactus-covered center of Ratones Island, Port of Poncé, Porto Rico (654); sandy shore near Georgetown, Grand Cayman (1248); and at the southwest end of Perez Island, Alacran Shoals (1746), but on no other islet of the group.

CYPERUS PLANIFOLIUS L. Cl. Rich. Act. Soc. Hist. Nat. Par., 1:106.

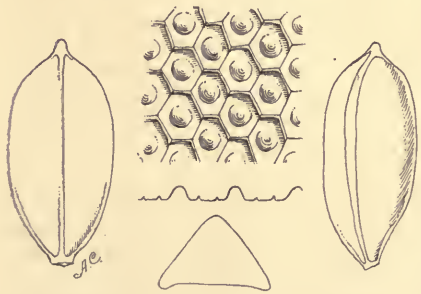
Cyperus purpurascens Vahl.

Cyperus bruneus in part Britton, on page 28.

Mariscus purpurascens Clarke.

Mariscus planifolius Urb.

Bracts 4, leaf-like, .5-3 dm. long. Inflorescence a 4-10-rayed spreading umbel, 5-6 cm. wide; rays 1-4 cm. Spikes reddish-brown, broadly oblong or when densely fruited subglobose, 2-2.2 cm. wide; bractlets 2-6 cm. long, narrow, and often bristle-like; spikelets 10-30, compressed oblong, 2 x 10-15 mm., 6-10-fruited; rachilla narrowly winged. Scales reddish-brown with a green keel, ovate, obtuse, striate, hyaline-margined, loosely imbricated, twice the length of the achene. Style twice the length of the achene, divided half its length. Achene dark reddish-brown, ellipsoid, .7-.75 x 1.9 mm., in section triangular with a rounded dorsal angle; facets marked by sharp hexagonal reticulations, the interspaces occupied by semi-globular papillæ larger than in C. brizæus.



On low sandy fields at The Creek, Cayman Brac (1182); and the west shore of the Isle of Pines, Cuba (1427).

§ *TORULINIUM.*—Characters of § *Mariscus* except: Spikelets terete or subterete; rachilla deciduous in 1-fruited nodes, with broad wings clasping the achene. Spikelets more loosely disposed in pectinate or digitate spikes.

CYPERUS FERAX L. Cl. Rich. *loc. cit.*

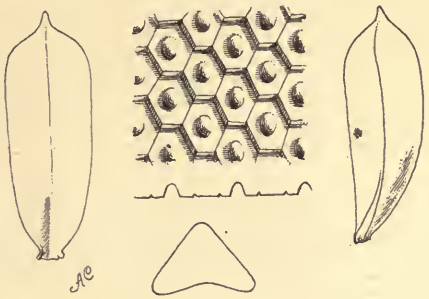
Cyperus densiflorus Britton, on page 28.

Torulinium confertum Ham.

Torulinium ferax Urb.

Bracts leaf-like, 1-4 dm. long. Inflorescence in a compound spreading umbel, 10-20 cm. wide; primary rays 3-6, 1-10 cm. long; secondary rays 1-2 cm. long. Spikes broadly flabellate in out-

line, 2.5-4 x 3.5-4.5 cm., composed of 16-20 pectinately spreading spikelets. Spikelets rufous, subterete, linear, zigzag, 1 x 15-30 mm., 5-12-fruited; rachilla wings large, enfolding the achene. Scales rufous, closely appressed to the rachilla, those of the same rank separated from each other for a distance equal to half their length, all ovate, obtuse, less than twice the length of the achene, the dorsum convex, not keeled, the median stripe broad, green, 7-nerved. Style twice the length of the achene, divided for half its length. Achene black, elongate-obovate, .45-.55 x 1.8 mm.; in section triangular, the dorsal facets plane, the ventral deeply convex; markings as in the preceding species, but the papillæ much higher.



Along the border of the lagoon south of Progreso (1671); and in deep woods at Chichen Itza, Yucatan (1637, 1773).

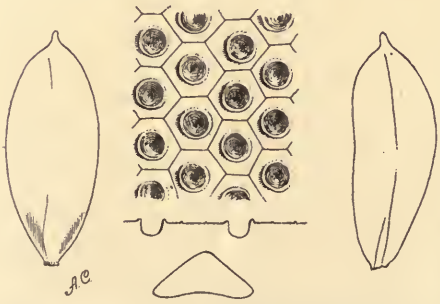
Cyperus Michauxianus Schultes, Syst. Mant., 2:123.

Cyperus speciosus Vahl.

Cyperus acicularis Britton, on page 28.

Torulinium Michauxianum Clarke.

Bracts leaf-like, 5-12 cm. long. Inflorescence a compound umbel, 15-20 cm. wide; primary rays 8-10, 1-11 cm. long; secondary rays 1-6 cm. long. Spikes oblong in outline, 1.5-2.5 x 3-4 cm., composed of 30-50 horizontally spreading spikelets. Spikelets brown, less terete than in the preceding species, 1.5 x 10-12 mm., 10-12-fruited; rachilla wings smaller, enfolding the lower half of the achene. Scales loose, obliquely spreading, slightly imbricated, reddish-brown with a broad, green, minutely striate dorsal stripe; acute, submucronate, less than twice the length of the achene. Style longer than the achene, divided to near the base. Achene rusty-black, ellipsoid, .5-.6 x 1.4 mm., flatly triangular in section, the ventral facet somewhat concave; surface marked by faint hexagonal ridges, the large interspaces occupied each by a deep circular pit with a prominent lip.



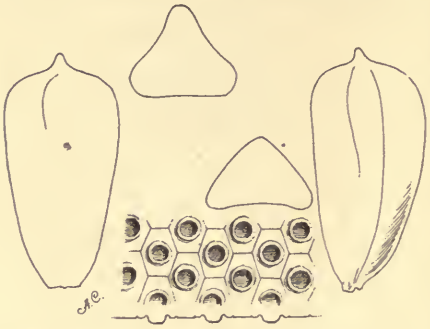
Boggy spot in an open field at Caguas, Porto Rico (219).

Cyperus filiformis Sw. Prod. Veg. Ind. Occ., 20.

Torulinium filiforme Clarke.

Bracts 2 or 3, 5-12 mm. long. Inflorescence in usually 1, sometimes 2 spikes, flabellate in outline, 1.5 cm. wide, composed of

5 - 9 subdigitately spreading spikelets. Rachis short. Spikelets pale - brown, subterete, 1 x 10-14 mm., 6-8-fruited. Rachilla wings broad, enfolding the achene. Scales distant nearly half their length, little longer than the achene, their sides enrolled, nearly meeting around the the rachilla, pale-brown, dorsally convex, median stripe broad, green, striate; all ovate, subacute, and hyaline-margined. Style longer than the achene, divided to near the base. Achene dark-brown, turbinate, .65-.7 x 1.6 mm., more or less triangular in section, the upper third of the dorsal facets concave, the lower convex; the upper third of the ventral plane, the lower having prominent rounded angles. Surface marked as in the preceding species, but the pits shallower and the reticulations closer.



Ditches near Spot Bay, Grand Cayman (1296).

SCLERIA Berg.

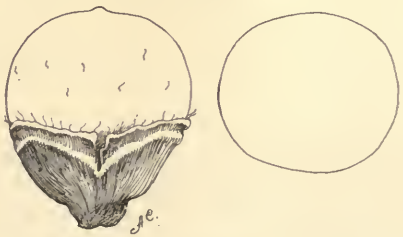
Flowers all unisexual; staminate and pistillate spikelets separate or borne in the same cluster. Fertile spikelet 1-flowered; staminate many flowered. Scales imbricated, the lower empty. Bristles none. Stamen 1. Style 3-cleft; achene subglobose, bony, supported on a hypogynous disk.

SCLERIA PTEROTA Presl. Oken. Isis, 21:268.

Scleria communis Kunth.

Schœnus latifolius Vahl.

Bracts leaf-like, 5-10 cm. long. Inflorescence a compound panicle, 2-2.5 x 5-15 cm. Rachis 3-sided, the angles winged. Secondary panicles axillary, bractlets .5-1 cm. long. Spike pediceled, composed of 1-3 fertile spikelets below and 1 staminate spikelet above; the fertile 4 mm. long, 2 lower scales empty; the staminate 5 mm. long. Fruiting scales fuscous, orbicular, mucronate, shorter than the achene; lower empty scales of staminate flowers fuscous, ovate, mucronate; stamen-bearing scales oblong, obtuse. Achene shining ivory-white, depressed globose (exclusive of the hypogynum), 2.5 x 3 mm.; hypogynum 1.5 mm. high, trilobate, pale straw-color above, reddish-brown below. Achene in section nearly circular with no indication of angles, the surface smooth, with a few scattered, white, microscopic hairs.



Moist spot in deep woods, high on the mountain, back of Charlotte Amalia, St. Thomas (506).

CAKILE.

The species of the genus Cakile in North and Subtropical America, have long been a puzzle to systematists, C. maritima, C. æqualis and C. Americana with their forms, having been interchanged and intersynonymized to a considerable extent, mostly on account of the variance of the leaves in specimens from different localities. It was not until after a discriminative study of the fruits and seeds in the specimens of this herbarium, and those of the Cambridge, Missouri, and New York Botanical Gardens, and the United States National Museum, that I was able to satisfactorily place the species, which now appear clearly defined.

The species-generating-force in the genus seems to have been the development of the fruit for disseminating the plants in, and from, what in each instance has been their habitat. It appears evident from the separation of the articulations of the loment, of which the upper becomes easily detached while the lower falls with great difficulty, that the former is intended to be disseminated by water, near which the plant always grows; while the latter is intended either to be carried by birds, or to be sown by the plant in the environment of the parent. This conclusion appears to be well substantiated in regard, at least, to the upper articulation, by the fact of the greater sponginess of its pericarp, which is well adapted for floating, and the cylindrical or globose form of the articulation itself, which, with its ready separation from the lower when ripe, by the wind, renders its progress to the water easy of achievement. The evolution for floatage seems to have reached its height in the new species growing upon the Alacran Shoals, from which, on account of their very limited area, the plant seems to have appreciated the necessity of removing itself as speedily as possible, and is increasing the possibility of reaching a better habitat, by a great development of spongy tissue in the upper or floating articulation; while the lower articulation, with the apparent appreciation of the fact that there are no seed-eating birds on the islets, and very little room along the limited strand to accommodate much increase in the number of plants, has become reduced to little more than a swelling of the pedicel.

CAKILE Tourn.

Silique lomentaceous, oblong or more or less cylindrical, biarticulate usually below the middle, joints more or less thick walled especially the upper; upper joint 1-spermous, seed erect; lower joint 0-2-spermous, seed suspended when 1-spermous, when 2, the lower erect; cotyledons plane, accumbent; stigma sessile, capitate:

Lower joint often 2-spermous:
  Upper joint corrugated.....C. geniculata
  quadrangular.....C. fusiformis
Lower joint 1-spermous:
  Upper joint slender—
    8-angled.....C. Americana
    4-angled.....C. æqualis
  Upper joint turgid:
    4-angled.....C. edentula
    4-grooved.....C. Alacranensis
    6-grooved.....C. Chapmanii
    10-grooved.....C. Cubensis
  Two horned at the articulation.....C. Cakile
Lower joint aspermous.....C. monosperma

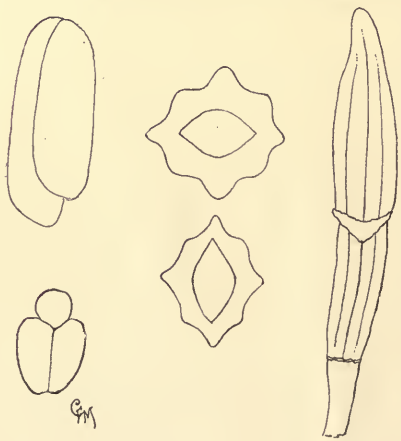
Cakile geniculata (Robs.) comb. nov.

C. maritima geniculata Robinson Syn. Fl. N. A., 1, 1:132.

C. Americana Robinson ibid, referring to Canby, Enterprise, Fla. 156.

C. maritima æqualis Coult. Cont. U. S. Nat. Herb., 1:31, and 2:32.

Silique large, tumid throughout, subcylindrical, corrugated, 2.7 cm. long, the articulation horizontal, strongly lipped. Upper joint subcylindrical, tapering to a somewhat pugiform apex, 1.6 cm. long, corrugated by 8 deep sulci; seed oblong, dark-brown, 5 x 2.3 mm. Lower joint subcylindrical, tapering slightly to the base, more shallowly corrugated; seeds 1-2 most frequently 2, well developed, 4.4 x 2.5 mm. and 4.25 x 2.25 mm. when two; 4.4 x 2.6 mm. when solitary.



Stems thick, axis of fruiting raceme very stout and strongly geniculate, pedicels stout. Leaves lanceolate, blunt, tapering to a short petiolar base, sparingly, blunt and distant, large-crenate toothed. Dr. Robinson, in describing the type from which the above characters are drawn, says: "Foliage of the type," but in so stating he considers our

The cuts present: An enlargement of the fruit; a section of the upper and the lower joints; the seed, and a transverse section showing the arrangement of the cotyledons. The enlargements are relatively the same in all the cuts.

American seaboard forms of C. Americana, C. fusiformis, and C. Cakile, to be C. maritima.

Habitat: The northern shores of the Gulf of Mexico, especially the Texas coast.

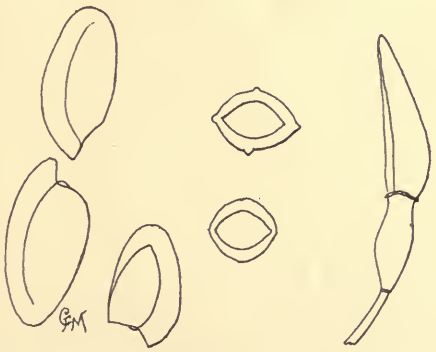
Specimens examined: Enterprise, Florida, *Canby;* Galveston, Texas, *Lindheimer;* Matamoras, Texas, *Berlandier 3103* the type; and Brazos de Santiago, Texas, *Neally 149.*

Cakile geniculata × edentula hyb. nov.

A form with greatly enlarged 2-seeded lower joints, as long or longer than the upper, and strongly ribbed, was collected in 1893 on Staten Island, New York, by Mr. T. H. Kearney. This strongly suggests a ballast plant of C. geniculata tainted by crossing with the native C. edentula.

Cakile fusiformis Greene, Pitton., 3:346.

Silique slender, elongated fusiform, curved, 2.1 cm. long, the articulation horizontal and unlipped. Upper joint pugiform, 1.3 cm. long, gradually tapering from the swollen base; seed light-amber, elongated and but slightly flattened, 4.4 x 2 mm. Lower joint cylindrical-fusiform, .8 cm., often 2-seeded; seeds when two 4.7 x 1.8 and 3.5 x 1.8 mm.; when single 4.6 x 1.9 mm. These characters are drawn from the type of which Prof. Greene says: "lower joint sterile."



Leaves thin, 5-8.5 cm., tapering to a very slender petiolar base, deeply and irregularly pinnatifid, the segments linear-oblong, obtuse.

Habitat: From the Florida Keys to Cape Corientes, Cuba.

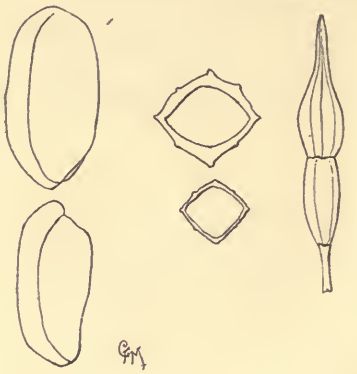
Specimens examined: Salt Pond Key, off the coast of Florida, *Pollard 19*, sheet 330019 Herb. U. S. Nat. Mus., marked "type" by Prof. Greene; Marquesas Key, Florida, *Curtiss 198* and *5;* Key West, Florida, *Blodgett, Binney;* Knight's Key, Florida, *Curtiss 5645;* Coon Key, Florida, *Simpson, 242;* Sanibel Island, Florida, *Webber 177;* Indian river, east Florida, *Palmer 12;* Dog Key, Mississippi, *Phares;* and Cape Corientes, Cuba, *Millspaugh 1465* (see p. 43 under C. maritima).

Cakile Americana Nutt. Gen. Am., 2:62, first part of descr.

C. maritima Americana T. & G. in part, referring to specimen collected on Long Island, New York, by Dr. Torrey.

Silique slender, 2 cm. long, with a horizontal articulation. Upper joint ovoid, long and slender pointed, 8-angled, 1.2 cm. long, nearly circular in section, walls thin; seed oblong, 4.6 x 2.2 mm., but slightly compressed. Lower joint truncated-fusiform, .8 cm., quadrate in section, very thin walled; seed 4.1 x 1.6 mm.

Leaves similar to the last in shape but averaging much smaller, and with crenate dentations tending to laceration, and even lobation, on one side toward the base.

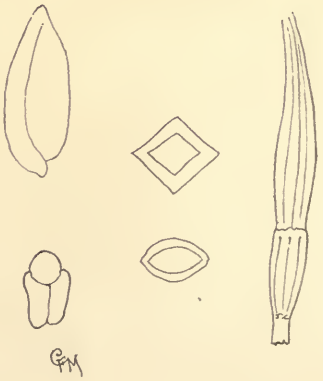


Habitat: The Atlantic coast of North America from the Connecticut shore to South Carolina, and on the strand of the Great Lakes. One specimen in Herb. N. Y. Bot. Garden from the Channel Islands, England, is doubtless a ballast plant from the above habitat.

Specimens examined: Orange, Connecticut, *Bissell 69;* shores of Long Island, New York, *Torrey;* Atlantic City, New Jersey, *Parker;* Walnut River, North Carolina, *Knowlton,* Smith's Island, North Carolina, *Herb. Biltmore* 4986*a;* North Carolina coast, *McCarthy;* mouth of Stone River, South Carolina, *Gibbes;* Lake Erie, Canadian side, *Coville, Pollard;* Sandusky, Ohio, *Moseley;* Indiana shore, Lake Michigan, *Umbach;* Illinois shore, Lake Michigan, *Vasey, Scammon, Lansing;* Wisconsin shore, Lake Michigan, *Lapham, Fellows, Hasse;* and Michigan shore, Lake Michigan, *Uline, Wheeler.*

CAKILE ÆQUALIS L'Herit. de C. Syst., 2:430.

Silique short-pediceled, very slender, elongated-subcylindrical, curved and long-pointed, 2.4-2.6 cm. long, the articulation transverse and unlipped. Upper joint pugiform, gradually narrowing from the base to the apex, in section quadrilateral, with a slightly marked striation on each facet; seed ovoid, 3.7 x 1.7 mm., pinkish. Lower joint subcylindrical, tapering slightly to the base, elliptic in section and nearly smooth; seed 3.9 x 1.6 mm. Stems somewhat ligneous, virgate, 35-50 cm. long, leafy branches extended. Leaves thin, ovate-lanceolate, narrowing to a short and slender petiolar base, shallow and irregularly crenate-dentate above the middle, 4-6.5 cm. long.



Habitat: From the Bahamas westward to the Alacran Shoals. The principal Antillean representative of the genus.

Specimens examined: New Providence, Bahamas, *Cooper 88;* St. Thomas, *Eggers 209;* New Fort, St. Croix, *Ricksecker 68;* Culebras Island, *Millspaugh 626,* (see p. 43 under C. maritima); Santurce, Porto Rico, *Heller 256, Millspaugh 272,* (ibid); Bayamon, Porto Rico, *Sintenis 1265;* Playa, Porto Rico, *Millspaugh 676,* (ibid); Guanica, Porto Rico, *Sintenis 3503* and Cabo Rojo *591;* Hastings, Barbados, *Waby 31;* The Creek, Cayman Brac, *Millspaugh 1159, 1179,* (ibid); Spot Bay,

Grand Cayman, *Millspaugh 1308*, (ibid); Mugeres Island, Yucatan, *Gaumer 182* and *Millspaugh 13*, Armour Exped.; Silam, Yucatan, *Gaumer 1244;* and on Chica and Allison Islands, Alacran Shoals, *Millspaugh* (ibid).

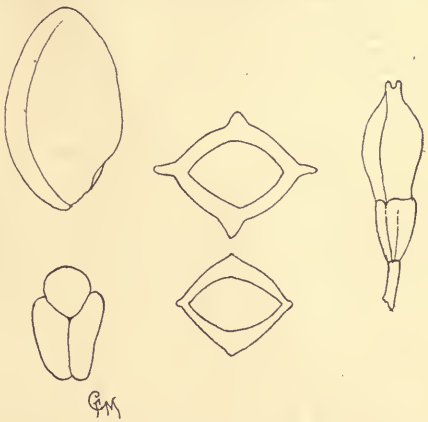
CAKILE EDENTULA (Bigel.) Hook. Fl. Bor. Am., 1:59.

C. Americana Nutt., latter half of description.

Bunias edentula Bigel.

C. maritima Americana T. & G. in part, referring to specimen collected at Portland Harbor, Lake Erie, by Knieskern.

Silique somewhat turgid, about 1.8 cm. long, turbinate, the articulation somewhat V-shaped. Upper joint flattened pyriform, strongly 4-angled, 1 cm. long, the blunt and often ensiform apex at times emarginate, or 2-3-crenate toothed, section ovate, the walls but little thicker than those of the lower joint; seed 4.3 x 2.5 mm., flattened, the cotyledons strongly marked. Lower joint truncated-fusiform, .8 cm., somewhat quadrate in section, the angles less prominent than those of the upper joint. Seed 4.5 x 2.1 mm., more cylindrical than that of the upper joint.



Leaves lanceolate-spatulate, the rounded apex crenate-toothed.

Habitat: The Atlantic coast of North America, from Labrador to South Carolina, and on the strand of the Great Lakes. Introduced at Berkeley, California, and Fayal, Azores Islands.

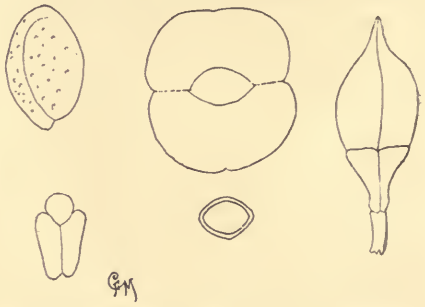
Specimens examined: Forteau, Labrador, *Waghorne;* sea beach at Coal River, Newfoundland, *Waghorne;* Eel River, Restigouche, and Miramichi, New Brunswick, *Fowler;* Cape Breton, Nova Scotia, *Macoun;* Seal Harbor and Vinal Harbor, Maine, *S. Watson;* Mount Desert, Maine, *Redfield;* Camden, Maine, *Briggs;* Beverly, Massachusetts, *Engelmann;* E. Boston, Massachusetts, *Boott;* Ipswich, Massachusetts, *Oakes;* Massachusetts, *Curtiss;* Provincetown, Massachusetts, *Fritchy;* Wood's Holl, Massachusetts, *Palmer;* Amherst, Massachusetts, *Kellerman;* Nantucket, Massachusetts, *Vasey;* Green's Farms, Connecticut, *Pollard;* Wading River, Long Island, *Miller;* Fire Island, New York, *Addison Brown;* New Dorp, Staten Island, *Tyler, Kearney, Small,* and South Beach, *Britton;* Sandy Hook, New Jersey, *Timmerman;* New Jersey coast, *Silicul, Short;* Ocean View, Virginia, *Kearney;* Smith's Island, North Carolina, *Herb. Biltmore;* James' Island near Charleston, South Carolina, *C. E. Smith;* Sullivan Island, South Carolina, *Ravenel;* Canadian shore of Lake Ontario, *Britton, Macoun 180;* Cacouna, Canada, *Northrup 236;* Lake Erie strand at Buffalo, *Merriam,* at Portland Harbor, *Knieskern,* at Cedar Point, Sandusky, *Stair,* and at Vermillion, Ohio, *Ricksecker;* Michi-

gan at Sault St. Marie, *Pitcher;* Lake Michigan strand at Chicago, Illinois, *Pammel, Lansing, Millspaugh;* Berkeley, California, (introduced) *Greene, Jepson.* (Fayal, Azores, *C. S. Brown 8.*)

Cakile Alacranensis sp. nov.

C. maritima on p. 43.

Silique very turgid, 1.6 cm., turbinate, with a slightly lipped horizontal articulation. Upper joint conoidal, very thick walled, 2-grooved, 1.1 cm. long, orbicular in section, the apex straight pointed; seed 3.1 x 1.8 mm., pinkish tinged with yellow, the surfaces dotted with brownish punctæ, cotyledons strongly demarked. Lower joint fertile, infundibuliform, but little more than a swelling of the pedicel, thin walled, ovate in section, 6 mm. long; seed 3.5 x 1.3 mm, cylindrical, well developed, usually more thickly punctate than that of the upper joint.



Plants large and spreading, thick-stemmed, bushy-branching, 20-40 cm. high. Racemes 15-25 cm. long, densely fruited. Leaves yellowish-green, spatulate-lanceolate, tapering to a partly clasping petiolar base; entire, or rarely slightly crenate or crenate-dentate at the apex, 3-7 cm. long, .8-2.1 cm. broad.

Habitat: Strand of Perez and Pajaros Islands, Alacran Shoals, Gulf of Mexico, *Millspaugh 1744, 1764, 1767* (see note concerning these numbers on p. 43, comparing the living appearance of this species with that of C. æqualis which grows upon Chico and Allison Islands of these shoals).

(There is a sheet in herb. Gray, Cambridge, upon which is a leaf and a portion of the inflorescence of C. fusiformis Greene, collected at Key West, Florida, by Mr. Binney; associated with these is a large packet of fruits of C. fusiformis, mixed with a still greater number of upper joints of C. Alacranensis. Although there are no formed fruits on the raceme of the flowering specimen attached to this sheet, yet those in the packet are fully ripe. From whence these mixed fruits came it is impossible to state.)

Cakile Alacranensis × æqualis hyb. nov.

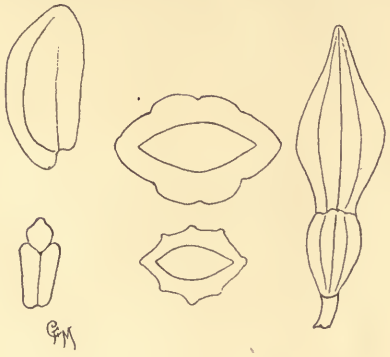
A specimen collected on the strand at Palm Beach, Florida, by *Mr. H. J. Webber* in 1895, No. *243* in herb. Mo. Bot. Garden, appears to be a cross between these species, a highly possible result, as the fruit of C. Alacranensis could reach that locality on the current of the Gulf Stream which sweeps the shores of the Alacrans on its way to the Florida keys.

Cakile Chapmanii sp. nov.

C. maritima æqualis Chapm.

Silique turgid, 2 cm. long, the articulation nearly horizontal.

Upper joint fusiform, thick-walled, 6-grooved, 1.3 cm. long, elliptic in section, blunt pointed at the apex; seed 3.8 x 1.7 mm., pinkish, the cotyledons strongly demarked. Lower joint globose, .7 cm. long, strongly 8-ribbed; seed 3.5 x 1.7 mm.



Stems erect, terete, whitish; branches virgate, 60-70 cm. long; leaves 4-7 cm. long, lanceolate, serrate-dentate especially beyond the middle, minutely verrucose, narrowing to a slender petiolar base.

Habitat: South Florida, to the mouth of the Mississippi river.

Specimens examined: Indian river, Florida, *Palmer 13* (1874); Florida, *Chapman*; Miami, Florida, *Garber*, No. 6472 in herb. U. S. Nat. Mus.; Ship Island, Mississippi, *Tracy 5049;* Islands of Mississippi Sound, *Hilgard;* Borders of saline ponds, Mississippi Sound, *Mohr;* Perdido Bay, Alabama, *Mohr.* Bermuda, *Kemp*, where it was doubtless carried by the Gulf Stream.

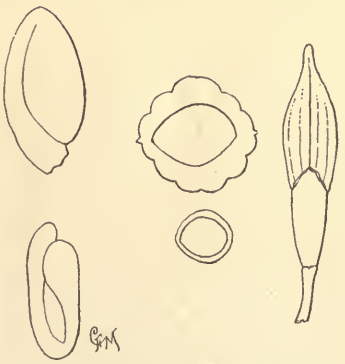
Cakile Cubensis Kunth, Nov. Gen. et Sp., 5:58.

C. Americana Cubensis deC.

C. maritima Cubensis Chapm.

C. æqualis Griseb. in reference to Wright's No. 1868, which specimen is, however, contrary to his description of C. æqualis in Fl. Br. W. I. 14.

Silique inverted turbinate, 1.8 cm. long, the articulation slightly angled and lipped. Upper joint somewhat turgid, inverted-turbinate, 1.1 cm. long, 2-angled, globose in section, and marked by 10 evident sulci; seed reddish-brown, 4.5 x 1.9 mm., somewhat flattened. Lower joint terete, appearing like a thickening of the pedicel, .7 cm. long, quite ligneous in texture, unmarked by angles or grooves; seed cylindric, 3.8 x 1.3 mm.



Leaves lanceolate, narrowing to a blunt apex and a slender petiolar base, the margin entire (Wright No. 1863 in herb. Gray, Cambridge), or rarely the root-leaves irregularly and distantly crenate or slightly serrate (Wright No. 1863 in herb. U. S. Nat. Mus.), or all strongly serrate-dentate (Wright No. 1863 in herb. Torrey, in N. Y. Bot. Gard.).

Habitat: Keys of Florida, to Yucatan coast.

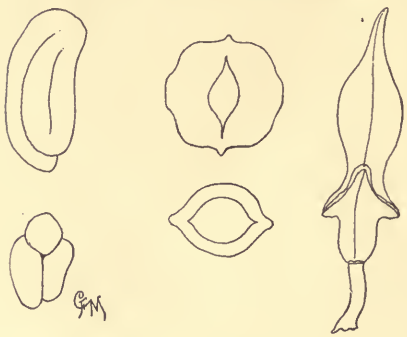
Specimens examined: Key West, Florida, *Tweedy 138;* Cuba, *Wright 1863;* Port Antonio, Jamaica, *Fredholm 3168, March 53;* Progreso, Yucatan, *Millspaugh 7* (1887); Celestun, Yucatan, *Schott 376;* Island of Cozumel, *Gaumer, 139.*

CAKILE CAKILE (Linn.) Karst. Deutsch. Fl., 663.

Bunias Cakile Linn.

Cakile maritima Scop.

Silique turgid, 2 cm. long, with a strongly lipped and sharply angled articulation, hastate by two more or less prominently projecting horns. Upper joint mitriform, thick-walled, 2-angled, 1.5 cm. long, nearly orbicular in section, the apex ensiform, acute; seed 4.3 x 2.5 mm., bright red, cotyledons strongly demarked. Lower joint generally fertile, hastate, comparatively thick-walled, 6 mm. long, 2-angled, ellipsoid in section; seed 4.6 x 2 mm., more nearly cylindrical than that of the upper joint.



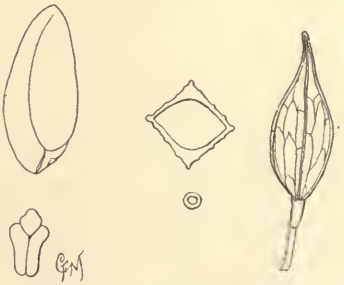
Leaves laciniate-pinnatifid, the divisions much more slender than in the following species.

Habitat: Northern Europe, especially the Baltic strand. Though mentioned by various authors as growing in America, it is found only on ballast grounds near the greater ports.

American specimens examined: Communipaw Ferry, Jersey City, New Jersey, *Addison Brown "B,"* in herb. Gray, Cambridge; Jersey City, New Jersey, *Schrenk;* Camden, New Jersey, *Parker;* Greenwich Point, Philadelphia, *Parker 10990,* in herb. Mo. Bot. Garden; Wilmington, North Carolina, *Gerald McCarthy* in herb. U. S. Nat. Mus., 227153.

CAKILE MONOSPERMA Lange, Pl. Nov. Hisp., 1:5, t. 7.

Silique fusiform, curved, 1.1-1.4 cm. long, the articulation inconspicuous, almost horizontal. Upper joint turgid, sharply quadrangular, long-pointed, strongly angled and prominently marked by anastomosing veins between the angles, diamond-shaped in section, the walls thin; seed reddish, elongated, 5 x 1.8 mm. Lower joint sterile, 1.5 mm., reduced to an apparent enlargement of the short pedicel and showing only a vestige of a cavity.



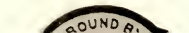
Prostrate, the lower leaves distantly pinnatifid, the few segments ligulate, entire, rounded at the apex; upper leaves spatulate, dentate at the rounded apex; uppermost leaves papillate with one or two rudimentary laciniæ.

Habitat: West coast of France, Spain and Portugal, and in ballast ground on the American seaboard. St. Jean de Luz, France, *Ball;* Boulogne, France, *L. F. Ward;* Geronde, Spain, *Ferret.*

American specimens examined: Ballast near Communipaw Ferry, Jersey City, New Jersey, *Addison Brown*, Sept. 1880, in herb. Columbia University at New York Bot. Garden, and in herb. Gray, Cambridge.

Cakile Domingensis Tuss. Fl. Ant., 1:119 (1808).

I have been unable to find an Antillean specimen that will agree with the description of this species. It may be distinct. Neither the description nor the geographic location admit of its being *C. maritima* Scop. as synonomized in Index Kew.



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